

REMARKS/ARGUMENTS

Claims 1-16, 18 and 25-28 were pending. Claims 1-4, 6-16, 18 and 25-27 were rejected. Claims 5 and 28 were objected to.

Claim 1 has been amended. Claims 18, 25 and 26 have been canceled. A new Claim 29 has been added.

Claims 1, 8 and 25-27 were rejected under 35 U.S.C. 103(a) as being unpatentable over Orczyk et al. in view of Redeker et al.

Claim 1 has been amended to clearly define over this combination of references. For example, Claim 1 now recites "terminating the processing of the wafer," "cooling the wafer" and "removing the wafer from the reaction chamber" and further specifies that "no further processing of the wafer occurs between said cooling the wafer and said removing the wafer from the reaction chamber." Although Orczyk et al. describe "cooling the substrate" (col. 14, line 35), the "main deposition step," in which "[t]he majority of the FSG layer is deposited" occurs after the cooling step (col. 14, line 60; col. 15, line 22). Thus, Claim 1, as amended, clearly distinguishes over Orczyk et al.

The Examiner cited Redeker et al. as teaching "creating the plasma in the reaction chamber and inserting the wafer into the reaction chamber." A close reading of Redeker et al. reveals that this is not correct. Redeker et al. teach precoating an electrostatic chuck with a dielectric material using an HDP-CVD process (col. 9, lines 26-28), positioning a wafer on the chuck, and then processing the wafer (col. 9, lines 30-31), but nowhere do they indicate that the plasma is continuously turned on during these steps. In reading a reference, it is permissible to take into account its teachings as well as "the inferences which one skilled in the art would reasonably be expected to draw therefrom." *In re Preda*, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968), cited at MPEP § 2144.01. A person skilled in the art, on reading Redeker et al., could not reasonably infer that Redeker et al. insert the wafer into the chamber while the plasma is active, since Redeker et al do not say anything on the subject, and the contrary inference is equally possible.

The Examiner stated that it would have been obvious "to modify Orczyk et al. reference by including the step of creating the plasma in the reaction chamber and inserting the wafer into the reaction chamber in order to improve reliability and avoid premature release of the wafer during processing (col. 1, lines 10-15, col. 2, lines 25-60)."

The "reliability" and "premature release" referenced in these passages of Redeker et al. refer to "precoating a substrate receiving surface of an electrostatic chuck with a dielectric material after each chamber cleaning process (col. 2, lines 42-44). Redeker et al. do not state or suggest anywhere that "reliability" can be improved or "premature release" avoided by "creating the plasma in the reaction chamber and inserting the wafer into the reaction chamber." As noted above, Redeker et al. do not even indicate that the plasma is active when the wafer is introduced into the reaction chamber. In other words, a person of skill in the art would not be motivated to modify Orczyk et al. in the manner suggested by the Examiner because the advantages claimed by Redeker et al. relate to a feature (the dielectric layer on the chuck) that is entirely distinct from whether or not the plasma is active when the wafer is introduced into the chamber. Thus, the motivation for the combination expressed by the Examiner cannot be supported.

Thus Claim 1 is allowable over Orczyk et al. in view of Redeker et al. for at least these three independent reasons. Claims 8 and 27 depend from Claim 1 and are also allowable for at least the same reasons. Claims 25 and 26 have been canceled.

Claims 1-4, 6-11, 15, 16 and 27 were rejected under 35 U.S.C. 103(a) as being unpatentable over Kwan et al. in view of Redeker et al.

The Examiner cited the following portions of Kwai et al.: Figs. 1D, 3; col. 13, lines 47-67; col. 14, lines 5-10, 30-40, 50-55. The only reference in these parts of Kwai et al. to cooling the wafer occurs at col. 14, lines 33-34, where it is stated that "the wafer is cooled for the etching step" because "a lower temperature generally permits a more controlled etch" (col. 14, lines 36-37). Thus the etch process takes place after the wafer is cooled. Moreover, after the etch, Kwai et al. teach that "the gas chemistry is cycled back to the deposition phase" (col. 14, lines 43-44). Thus Kwai et al. clearly do not teach or suggest "terminating the processing of the wafer," "cooling the wafer" and "removing the wafer from the reaction chamber" such that "no further processing of the wafer occurs between said cooling the wafer and said removing the wafer from the reaction chamber," as now recited in amended Claim 1.

Redeker et al. are cited in combination with Kwai et al. as showing "creating the plasma in the reaction chamber and inserting the wafer into the reaction chamber." For the reasons stated above, a person skilled in the art would not reasonably infer from

Redeker et al. that they insert the wafer into the chamber while the plasma is active, as required by Claim 1.

The Examiner stated that it would have been obvious "to modify Kwai et al. reference by including the step of creating the plasma in the reaction chamber and inserting the wafer into the reaction chamber in order to improve reliability and avoid premature release of the wafer during processing (col. 1, lines 10-15, col. 2, lines 25-60)." The "reliability" and "premature release" referenced in these passages of Redeker et al. refer to "precoating a substrate receiving surface of an electrostatic chuck with a dielectric material after each chamber cleaning process (col. 2, lines 42-44). Redeker et al. do not state or suggest anywhere that "reliability" can be improved or "premature release" avoided by "creating the plasma in the reaction chamber and inserting the wafer into the reaction chamber." As noted above, Redeker et al. do not even indicate that the plasma is active when the wafer is introduced into the reaction chamber. In other words, a person of skill in the art would not be motivated to modify Orczyk et al. in the manner suggested by the Examiner because the advantages claimed by Redeker et al. relate to a feature (the dielectric layer on the chuck) that is entirely distinct from whether or not the plasma is active when the wafer is introduced into the chamber. Thus, the motivation for the combination expressed by the Examiner cannot be supported.

Therefore, Claim 1 is believed to be allowable over the combination of Kwai et al. and Redeker et al. for at least these three independent reasons. Claims 2-4, 6-11, 15, 16 and 27 depend from Claim 1 and are allowable for at least the same reasons.

Claims 14 and 18 were rejected were rejected under 35 U.S.C. 103(a) as being unpatentable over Kwan et al. in view of Redeker et al. and further in view of Chang et al. Chang et al. were cited as teaching "etching a photoresist and the wafer having a gate dielectric layer." Claim 14 depends from Claim 1. For the reasons noted above, Claim 1 is allowable over the combination of Kwan et al. and Redeker et al. Applicant has reviewed Chang et al. and finds nothing in Chang et al. that overcomes the defects of the combination of Kwan et al. and Redeker et al. insofar as the patentability of Claim 1 is concerned. Claim 14 is therefore allowable over the combination of Kwan et al., Redeker et al. and Chang et al. Claim 18 has been canceled.

Claims 12 and 13 were rejected were rejected under 35 U.S.C. 103(a) as being unpatentable over Kwan et al. in view of Redeker et al. and further in view of Wang et al. Wang et al. were cited as teaching "a plasma process to deposit a phosphorous-doped silicon dioxide layer (col. 6, lines 30-40)." Claims 12 and 13 depend from Claim 1. For the reasons noted above, Claim 1 is allowable over the combination of Kwan et al. and Redeker et al. Applicant has reviewed Wang et al. and finds nothing in Wang et al. that overcomes the defects of the combination of Kwan et al. and Redeker et al. insofar as the patentability of Claim 1 is concerned. Claim 12 and 13 are therefore allowable over the combination of Kwan et al., Redeker et al. and Wang et al.

The Examiner indicated that Claims 5 and 28 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 5 and 28 depend from Claim 1. For the reasons stated above, Applicant believes the Claim 1 is patentable and that there is no reason at this point in the prosecution to rewrite Claims 5 and 28 in independent form. Applicant reserves the right to do this later in the prosecution if required.

New Claim 29 is somewhat similar to Claim 1 but omits the limitation "inserting the wafer into the reaction chamber." Claim 29 is believed to be allowable over Orczyk et al. and Kwan et al. for at least the reasons stated above.

For the above reasons, Applicant respectfully requests allowance of Claims 1-16 and 27-29. Should the Examiner have any questions concerning this response, the Examiner is invited to call the undersigned at (408) 982-8201.

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